WHALE TAIL PIT PROJECT

Groundwater Monitoring Plan

In Accordance with:
Project Certificate No. 008, T&C 15 and 16

Prepared by:
Agnico Eagle Mines Limited – Meadowbank Division

Version 2
November 2018

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) received a Project Certificate No.008 from the Nunavut Impact Review Board for the development of the Whale Tail Pit, a satellite deposit located on the Amaruq Exploration property.

The deposit will be mined as an open pit (i.e., Whale Tail Pit), and ore will be hauled by truck to the approved infrastructure at Meadowbank Mine for milling. Approximately 8.3 million tonnes (Mt) of ore will be mined from the open pit and processed over a three to four-year mine life. Ore from Whale Tail Pit will be crushed on site after which it will be transported to Meadowbank Mine for milling. The mill rate will be approximately 9,000 to 12,000 tonnes per day.

During mining, groundwater will flow into the open pit. This water is naturally high in total dissolved solids and will not be directly discharged out of the active mine site without treatment. Water management during mine operations will involve a variety of activities, described in detail in the Water Management Plan (WMP) developed for the Project (Agnico Eagle 2018a).

This document presents the Groundwater Management Plan (GWMP) for the Whale Tail Pit in accordance with Terms and Conditions No. 15 and 16 included in the Project Certificate. These terms and conditions has already been fulfilled whereby a multi-level Westbay well system has been put in place to obtain groundwater quality data and flow data, a detailed post-closure hydrogeological and permafrost model were completed, a detailed diffusion model was completed to more adequately define the effects of this chemical process from submerged pit walls, and a pit lake hydrodynamic model as well as a receiving lake (Mammoth Lake) hydrodynamic model were completed to assess the potential for meromixis and assess effects of all these processes. The results of the compendium of these studies indicated diffusion will not affect water quality in the pit lake; mass transfer to water is very low even under the conservative assumptions of the calculations. The study further determined that the seepage into and out of the pit lake are negligible in volume, particularly compared to surface water exchanged annually post-closure when flows are re-established based on average climate year watershed runoff. The combination of results corroborate to support that the hydrogeological regime around the pit lake is not critical to pit lake water quality.

DISTRIBUTION LIST

AEM – Geology Superintendent

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DOCUMENT CONTROL

Version	Date (YMD)	Section	Revision
1	2018-05-30	All	To address Project Certificate No. 008. T&C 15 and 16
2	2018/11/8	1.1, 2.4, 2.5	To address ECCC and CIRNAC recommendations issued in October 2018

Prepared by:
Golder Associates & Agnico Eagle Mines Limited - Meadowbank Division

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1 INTRODUCTION

Agnico Eagle Mines Limited – Meadowbank Division (Agnico Eagle) received Project Certificate No.008 from the Nunavut Impact Review Board (NIRB) for the development of the Whale Tail Pit (the Project), a satellite deposit located on the Amaruq Exploration property. The Amaruq Exploration property is a 408 square kilometre (km^2) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine in the Kivalliq region of Nunavut (Figure 1). The deposit will be mined as an open pit, and ore will be hauled by truck to the approved infrastructure at Meadowbank Mine for milling.

This document presents Groundwater Monitoring Plan (GWMP) for the Whale Tail Pit. Overall water management for operations, closure, and post-closure is described in the Agnico Eagle Water Management Plan (WMP) (Agnico Eagle 2018a). The WMP provides descriptions of the water control structures and associated design criteria.

1.1 CONCORDANCE

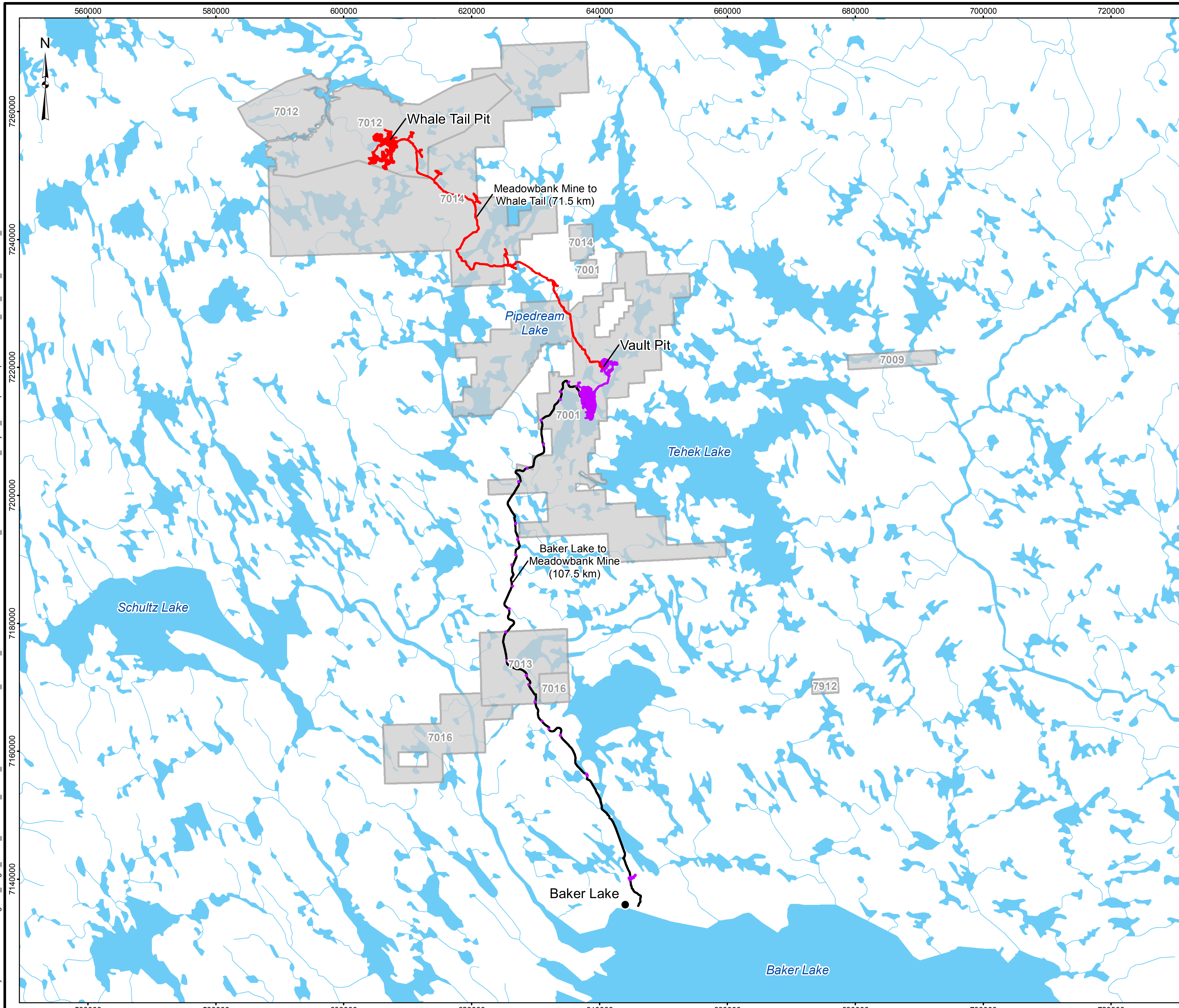
Meadowbank Mine is an approved mining operation and Agnico Eagle is planning to extend the life of the mine by constructing and operating the Project. The Project was subject to an environmental review established by Article 12, Part 5 of the Nunavut Agreement. In June 2016, Agnico Eagle submitted a Final Environmental Impact Statement (FEIS) seeking a reconsideration of the Meadowbank Mine Project Certificate (No. 004/File No. 03MN107) and Type A Water Licence Amendment (No. 2AM-MEA1525) from the NIRB.

On July 2016, the NIRB determined that the proposed Project required a separate screening assessment under the Nunavut Agreement and the *Nunavut Planning and Project Assessment Act* (NuPPAA). A separate Project Certificate (NIRB Project Certificate No. 008) was issued for the Project on March 15, 2018 by the NIRB. This GWMP reflects the commitments made with respect to submissions provided during the technical review of the FEIS, to comply with Terms and Conditions No. 15 and 16 included in the Project Certificate. These terms and conditions has already been fulfilled whereby a multi-level Westbay well system has been put in place to obtain groundwater quality data and flow data, a detailed post-closure hydrogeological and permafrost model were completed, a detailed diffusion model was completed to more adequately define the effects of this chemical process from submerged pit walls, and a pit lake hydrodynamic model as well as a receiving lake (Mammoth Lake) hydrodynamic model were completed to assess the potential for meromixis and assess effects of all these processes. The results of the compendium of these studies indicated diffusion will not affect water quality in the pit lake; mass transfer to water is very low even under the conservative assumptions of the calculations. The study further determined that the seepage into and out of the pit lake are negligible in volume, particularly compared to surface water exchanged annually post-closure when flows are re-established based on average climate year watershed runoff. The combination of results corroborate to support that the hydrogeological regime around the pit lake is not critical to pit lake water quality.

1.2 OBJECTIVES

The objective of the GWMP is to provide consolidated information on groundwater management for the Project. The GWMP is divided into the following components:

- Introductory section (Section 1)
- A brief summary of the physical and hydrogeological setting at the mine site, the mine development plan and FEIS pit inflow predictions (Section 2)
- A description of the groundwater monitoring program (Section 3)
- A summary of procedures for quality assurance and quality control (QA/QC) (Section 4)



LEGEND

- COMMUNITY
- PROPOSED HAUL ROAD
- ALL WEATHER ROAD
- WHALE TAIL PIT
- MEADOWBANK OPERATION AND INFRASTRUCTURE
- CLAIM BOUNDARY
- WATERCOURSE
- WATERBODY

REFERENCE

1. HAUL ROAD OBTAINED FROM AGNICO EAGLE MINES LIMITED. 2015-10-14
FROM 6103-117-230-200_R0.dwg
2. CLAIM BOUNDARIES OBTAINED FROM AGNICO EAGLE MINES LIMITED.
3. WATERCOURSE AND WATERBODY DATA OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
4. INSET MAP DATA OBTAINED FROM ESRI.

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

12 0 12
KILOMETRES

PROJECT
AGNICO EAGLE

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

LOCATION OF THE PROJECT

Golder Associates

PROJECT		1541520	FILE No.	
DESIGN	JR	24 Mar. 2016	SCALE AS SHOWN	REV. 0
GIS	CDB	24 Mar. 2016	**FIGURE 1.1**	
CHECK	JR	09 May 2016		
REVIEW	LY	09 May 2016		

Y:\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1541520_FEIS\02_PRODUCTION\FEIS\MXD\1300_Documentation\1340_Project_Description\Report\1541520_FIG_1.1-1_PROJECT_LOCATION.mxd

2 BACKGROUND

2.1 SITE CONDITIONS

The Project is located in Canada’s Northern Arctic ecozone. This region includes most of Canada’s Arctic Archipelago and northern regions of continental Nunavut and the Northwest Territories. This ecoregion is classified as a polar desert and is characterized by long cold winters and short cool summers. The mean air temperatures in June to September is approximately 7 degrees Celsius (°C) and -20.6 °C in October to May.

Average annual precipitation at Meadowbank Mine is 142.6 mm (1998 to 2004). The annual precipitation at site generally falls as rain between June and September, and snow between October and May. However, snowfall can occur at any time of the year.

Based on data for Baker Lake (120 km to the south), and from experience ice auguring within the Meadowbank Mine lakes in the winter, the mean maximum lake ice thickness over Whale Tail Lake is expected to be 2.25 m. During the winter collection of water quality baseline data in Whale Tail Lake in April 2016, ice thickness was confirmed to be 2 m.

The surficial geology of the Project area shows strong evidence of glacial activity and is dominated by veneers and blankets of till overlying undulating bedrock. Bedrock frequently outcrops in isolated exposures, elevated plateaus and elongated ridges. Lakes and ponds are abundant, occupying approximately 16% of the area.

The local overburden consists of till with a silty sand matrix and clasts that range from granule gravel to large boulders in size. Glaciofluvial deposits in the form of eskers and terraces are found in the northeast section of the satellite deposit and they continue in a southeast direction intersecting the haul road in several locations.

The bedrock geology in the Project area consists of Archean and Proterozoic supercrustal sequences and plutonic rocks.

2.2 HYDROGEOLOGY SETTING

2.2.1 Conceptual Model

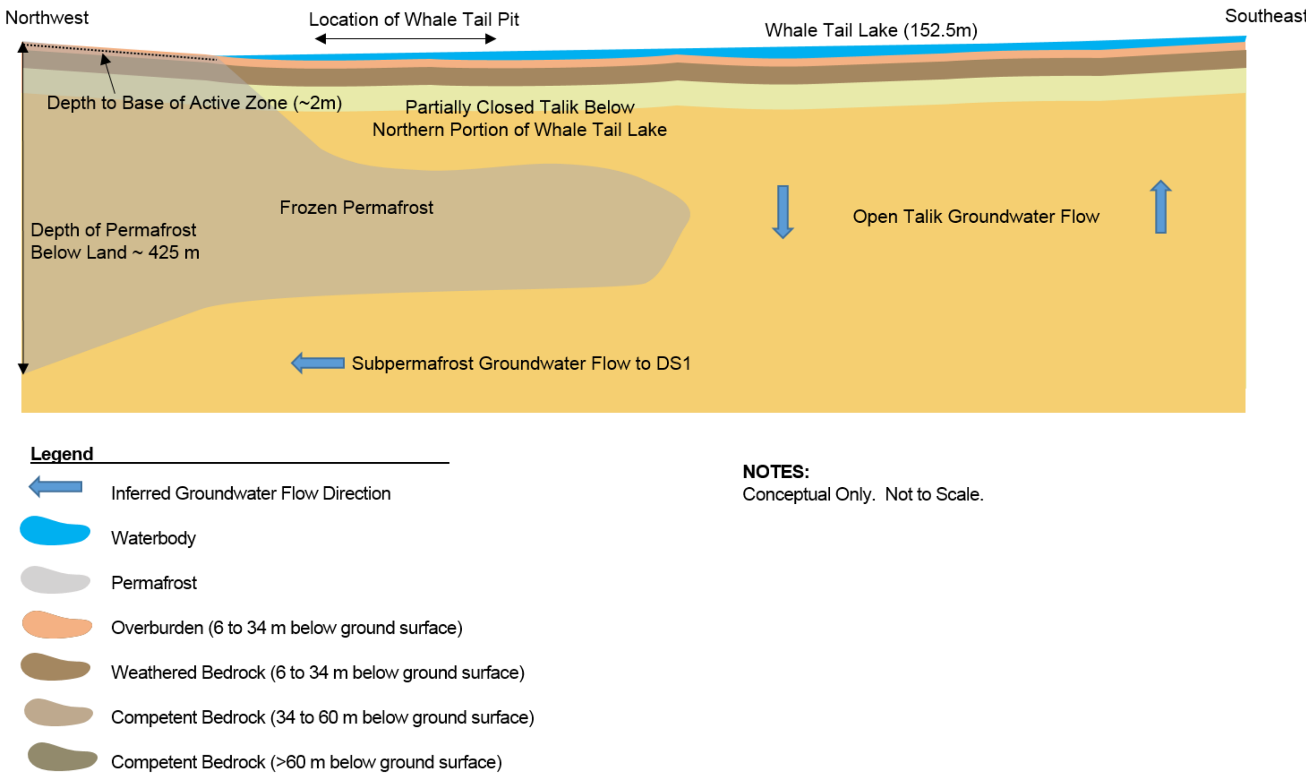
The Project is located in an area of continuous permafrost. In this region, the layer of permanently frozen subsoil and rock is generally deep and overlain by an active layer that thaws during summer. The depth of the active layer is typically expected to range between one and three metres. Depending on lake size, depth, and thermal storage capacity, the talik (unfrozen ground surrounded by permafrost) beneath lakes may fully penetrate the permafrost layer resulting in an open talik. Circular lakes with a radius greater than 300 m, or elongated lakes with a half-width of at least 150 m, are assumed to be connected to the deep groundwater flow regime through open taliks. The thickness of the permanently frozen permafrost was estimated to be on the order of 427 to 495 m.

In areas of continuous permafrost, there are two groundwater flow regimes: a deep groundwater flow regime beneath permafrost, and a shallow groundwater flow regime located in the active (seasonally thawed) layer near the ground surface. With the exception of areas of taliks beneath lakes, the two groundwater regimes are isolated from one another by thick permafrost.

The shallow groundwater regime is active only seasonally during the summer months, and the magnitude of the flow in this layer is expected to be several times less than runoff from snowmelt. Groundwater in the active layer primarily flows to local depressions and ponds that drain to larger lakes; therefore, the total travel distance would generally extend only to the nearest pond, lake, or stream. Water in the active layer is stored in ground ice during the cold season and is then released with the ice thaws in late spring or early summer, thus providing flow to surface. During the warm season, groundwater in the active layer is recharged primarily by precipitation.

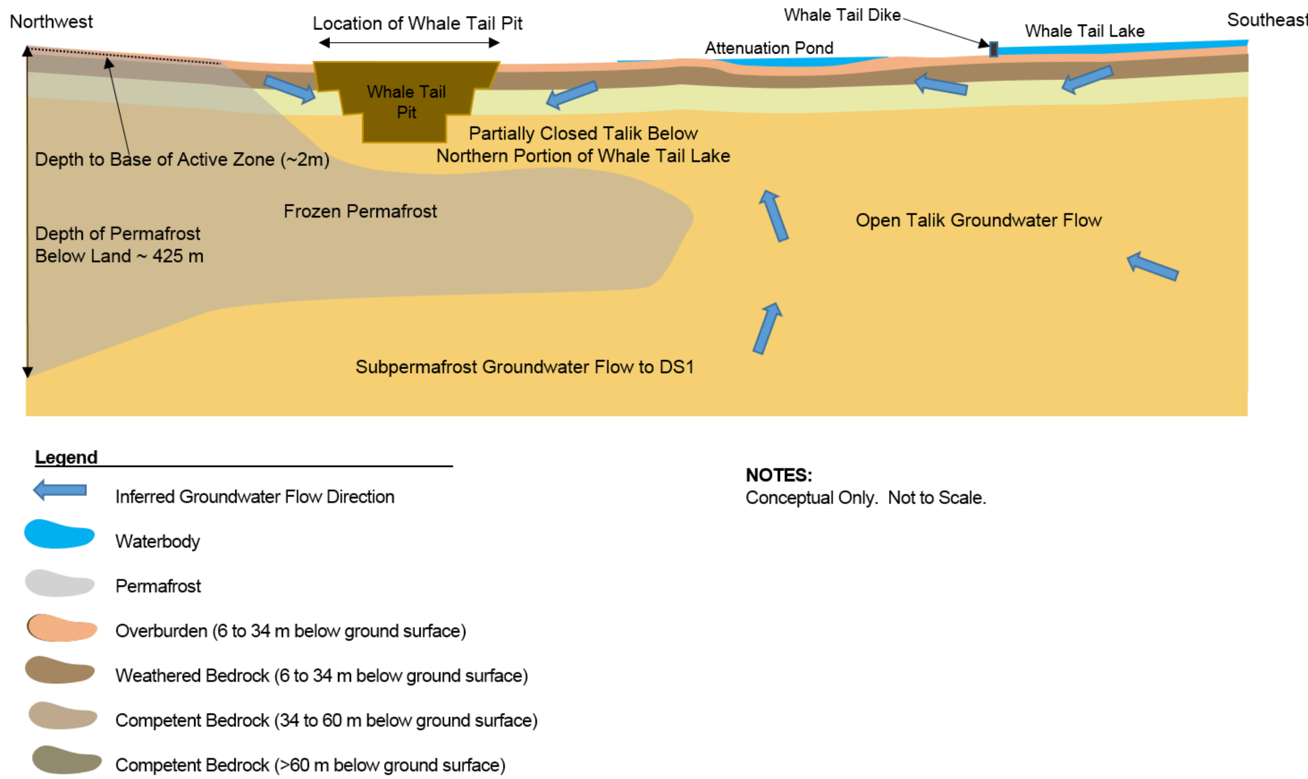
Groundwater flow within the deep groundwater flow regime is limited to the sub-permafrost zone. This deep groundwater flow regime is connected to the ground surface by open taliks underlying larger lakes. The elevations of these lakes are expected to be the primary control of groundwater flow directions in the deep groundwater flow regime, with density gradients providing a secondary control on groundwater flow directions. The elevations of these lakes in the baseline study area indicate that Whale Tail Lake is likely both a groundwater recharge and discharge zone (Figure 2). Hydraulic gradients are expected to range from slightly downward to slightly upward.

Figure 2: Conceptual Model of Pre-Mining Deep Groundwater Flow Regime - Cross-Section View



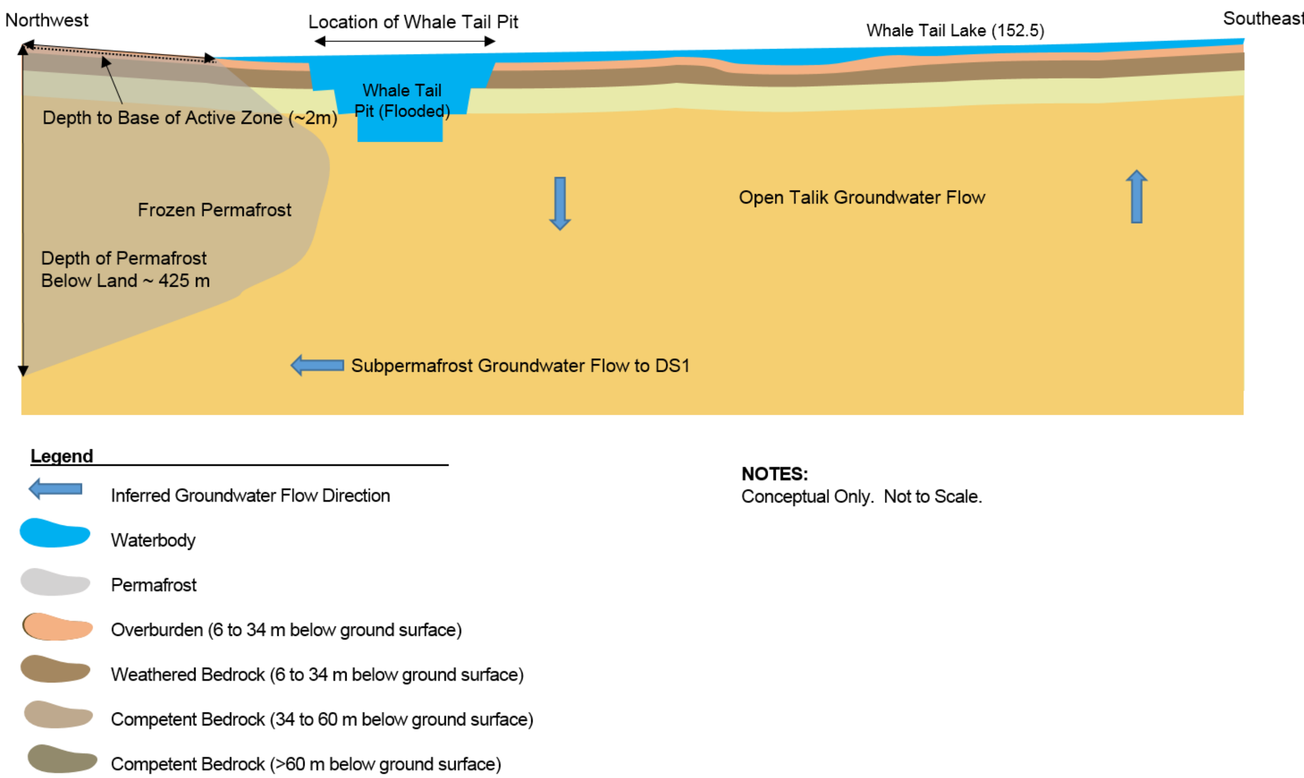
Below Whale Tail Lake, a talik is expected to form a continuous channel that is closed in the northern portion of Whale Tail Lake below the open pit and becomes open towards the south and central portion of the lake. As shown in Figure 3, during mining the open pit will act as a sink for groundwater flow, with seepage faces developing along the pit walls. In response to mining of the open pit, groundwater will be induced to flow through bedrock to the open pit. Mine inflow will primarily originate from Whale Tail Lake, the attenuation pond between the pit and Whale Tail dike, and deep bedrock. The quality of mine inflow will be a result of the mixing from each of these sources.

Figure 3: Conceptual Model of Deep Groundwater Flow Regime during Mining - Cross-Section View



During closure (Figure 4), the open pit will be flooded with water from a variety of sources including: water pumped from the flooded South Whale Tail watershed until the original Whale Tail Lake level is reached (152.5 m), the north-east watershed following the breach of the North-East dike, groundwater originating from nearby lakes underlain by open taliks, connate water and water pumped from the attenuation pond. This process will dissipate the large hydraulic head differences established during mine operations in the vicinity of the mine workings. The rate of groundwater inflow will decrease as the water level in the open pit rises. From the start of closure and following the formation of the pit lake in post-closure, permafrost below the pit is expected to thaw slowly. The thermal regime in the vicinity of the pit will be monitored, as outlined in the Thermal Monitoring Plan for the Project (Agnico Eagle 2018b).

Figure 4: Conceptual Model of Deep Groundwater Flow Regime in Long-Term Post-Closure - Cross-Section View



2.2.2 Groundwater Volumes and Quality

Potential groundwater inflow quantity and quality with respect to total dissolved solids was predicted in the FEIS using a groundwater numerical model (FEIS Volume 6, Appendix 6.B). A summary of these predictions is presented on Table 1 and Table 2.

Table 1: 2015 Predicted Groundwater Inflow to the Open Pit during Operations and Closure

Phase	Period	Groundwater Inflow (m^3/day)	TDS Concentration (mg/L)
Dewatering	Mar 2019 to Oct 2019	-	-
Mining	Q4 2019 to 2020	275	415
	2021	100	410
Filling	2022	65	370
	2023	55	365
	2024	30	370
	Jan to Oct 2025	15	370
	Nov 2025 to Oct 2028	1	370

Note: Mining prior to Q4 2019 is within permafrost and groundwater inflow will be negligible.
TDS = total dissolved solids; m^3/day = cubic metres per day; mg/L = milligrams per litre

Table 2: 2015 Predicted Groundwater Inflow to the Attenuation Pond during Operations and Closure

Phase	Period	Net Groundwater Inflow (m^3/day)	TDS Concentration (mg/L)
Dewatering	Mar 2019 to Oct 2019	-	-
Mining	Q4 2019 to 2020	2	160
	2021	1	170
Filling	2022	1	195
	2023	1	175
	2024	1	175
	Jan to Oct 2025	1	175
	Nov 2025 to Oct 2028	-	-

TDS = total dissolved solids; m^3/day = cubic metres per day; mg/L = milligrams per litre

In accordance with Project Certificate Term and Condition No. 16b and 16c, Golder conducted a supplemental hydrogeological assessment to predict the post-closure groundwater regime in the vicinity of the Whale Tail Pit (Golder 2018a). The purpose of the model simulations was to evaluate the effects of higher TDS groundwater beneath the open pit on the groundwater flow system after closure and to evaluate the influence of solute transport by density–driven flow on the movement of solutes from the bedrock into the flooded pit.

Table 3 presents the predicted groundwater inflow quantity and quality to the Whale Tail Pit during post-closure. The results of the post-closure hydrogeological assessment provided input into a concurrent study that was assessing overall water quality in the flooded pit (Golder 2018b). The post-closure model results show that, initially, once the hydraulic heads return to near equilibrium shortly after mine flooding, groundwater inflow into the pit lake is greater than pit lake discharge into surrounding bedrock. Over time, pit lake water is drawn downwards from the bottom part of the flooded pit into bedrock. Approximately 100 years after closure, pit lake water discharge into bedrock becomes greater than groundwater inflow into the pit lake. The relative difference in flow increases with time and as the permafrost layer beneath the pit lake is predicted to thaw.

Table 3: Predicted Groundwater Inflow and Groundwater Quality – Post-Closure

Years Following Closure	Groundwater Inflow to Pit Lake (m^3/day)	Average TDS Concentration into pit (mg/l)	Pit Lake Outflow to Groundwater (m^3/day)
1	2.2	650	1.1
10	1.1	540	0.8
100	0.2	440	0.8
500	0.1	77	1.7

2.3 ADDITIONAL DATA COLLECTION

Project Certificate Term and Condition No. 15 indicates the need to collect additional site-specific hydraulic data in key areas of the Project during the pre-development, construction and operational phases. Agnico Eagle has commenced with the collection and documentation of this data, and a summary of the results is presented below.

2.3.1 Groundwater Quality

At the time of the FEIS, a representative sample of deep groundwater had not been collected and data collected at the Meadowbank Mine was used to infer the TDS profile at the project. A Westbay well system was installed on site between March and April in 2016. The borehole was drilled to a depth of 499 m. The well was installed to monitor hydraulic heads, test hydraulic conductivity, and collect groundwater samples from multiple intervals (Golder 2016c). The groundwater samples collected from the Westbay system at depths from 276 m to 392 m indicate that the TDS content in the groundwater was between 3,198 mg/L and 4,042 mg/L. This range is slightly higher than the groundwater TDS measured at Meadowbank from shallower depths (less than 200m vertical depth).

These recent groundwater quality data will be used in subsequent updates to the water quality forecast in support of the Project. At this time, it is expected that the water treatment system planned for the project can handle groundwater with this concentration of TDS.

2.3.2 Hydraulic Conductivity Testing

Supplemental hydrogeological investigations have been undertaken between 2015 and 2017 to further characterize the hydraulic conductivity of the bedrock in the vicinity of the Whale Tail Pit. These investigations have been documented in reports by Knight Piesold (2016), Golder (2016a, 2017), and SNC (2017). These investigations included the completion of 49 packer tests in unfrozen areas of bedrock (i.e., within the talik or below the regional permafrost).

Data collected from these investigations indicate the bulk hydraulic conductivity of the bedrock ranges on the order of 1×10^{-5} m/s near surface (i.e., up to depths of 40 m) to approximately 1×10^{-9} m/s at greater depths. As part of the FEIS, the hydraulic conductivity was estimated to be between 1×10^{-8} and 2×10^{-7} m/s. Preliminary evaluation of these values with respect to groundwater flows indicate that the inflow to the pit could be up to five times higher (up to 1,400 m^3/day). It is expected that the combination of the water treatment system and water management infrastructure can handle these higher flows should they occur.

2.3.3 Groundwater Monitoring Plan

Water quantity and quality monitoring data will be used to verify the predicted water quality and quantity trends and to conduct adaptive management should differing trends be observed. Monitoring will be initiated at the start of mining and continue during operations and closure.

The GWMP will be further defined as the open pit is developed and will be conducted in agreement with the WMP for the Project.

2.4 WATER QUANTITY AND QUALITY MONITORING

2.4.1 Water Quantity

Groundwater inflow to the open pit will be collected in sumps prior to being pumped to surface. Water collected in the sumps represents the bulk, or combined inflow to the open pit, and may include other sources of water, such as precipitation. During construction and operations, groundwater inflow to the pit will be evaluated four time per calendar year as per Water Licence 2AM-WTP1826 requirements. Management of the pumped-out water is described in the WMP.

The above flow monitoring will be supplemented by periodic seepage surveys to be conducted twice during the first year of mining and once a year thereafter. In the first year of pit development, one of the seepage surveys will be conducted in early summer, following snow melt and thawing of any ice in the pit walls, and then again in late August. In the following years of mining, one survey will be conducted in August of each year. The objective of the seepage surveys is to identify preferential groundwater flow paths in the walls of the open pit, if present, and to determine their relative contribution to the groundwater inflow to the pit with respect to water quantity and quality.

2.4.2 Water Quality

During the operations phase, the quality of water from the sumps (either at the sump or at end of pipe at the surface) will be monitored four time per calendar year as per Water Licence 2AM-WTP1826 requirements.

Water samples will also be collected from seeps in the pit walls if there is sufficient water for analysis and if access to the seep is possible.

For each sample, field parameters will be recorded (pH, turbidity, salinity and electrical conductivity). Analytical parameters will include:

- Total and Dissolved Metals: aluminium, antimony, arsenic, boron, barium, beryllium, cadmium, copper, chromium, iron, lithium, manganese, mercury, molybdenum, nickel, lead, selenium, tin, strontium, titanium, thallium, uranium, vanadium and zinc.

- Nutrients: ammonia-nitrogen, total kjeldahl nitrogen, nitrate nitrogen, nitrite-nitrogen, ortho-phosphate, total phosphorous, total organic carbon, total dissolved organic carbon and reactive silica.

- Conventional Parameters: bicarbonate alkalinity, chloride, carbonate alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphte, pH, total alkalinity, total dissolved solids, total suspended solids and turbidity.

- Total cyanide and free cyanide. If total cyanide is detected above 0.05 mg/L at a monitoring station in receiving environment; further analysis of Weak Acid Dissociable Cyanide will be triggered.

Additional chemical analyses may be required to more completely characterize the chemical loading from the mine water. The additional analyses will be dependent on monitoring results.

2.5 DATA COMPILATION AND UPDATES TO GROUNDWATER MODEL

Groundwater monitoring data will be compiled into a Project-specific database and evaluated for trends in groundwater data with respect to pit and underground inflow quantity and quality.

Measured groundwater inflow rates will be compared to model predictions on an annual basis. If significant variations from model predictions are observed, the assumptions behind the data will be reviewed and the analysis updated if required. In addition, updates to the groundwater model will be made if operational changes occur as the open pit advances which could significantly alter groundwater inflow or quality.

Variations that would be considered significant include:

- Groundwater inflows to the mine, based on rolling monthly average of inflow over six consecutive months, is 20% higher than predicted groundwater inflow.
- Collected water samples that indicate that the TDS is more than 25% higher than the estimated water quality.

Observed inflow that is lower than expected with respect groundwater inflow and quality would not be of concern and/or effect water management plans on-Site. Model updates or analysis would therefore not be conducted if predicted inflow quantity and quality is higher than observed conditions.

If the above variations are observed, the groundwater data would be assessed to evaluate trends, the potential causes of the greater than expected groundwater inflow quantity or quality, and the potential for long-term effect associated with the groundwater flow or quality. If the greater than predicted flows were correlated to a short-term effect such as freezing in the pit walls, changes in mining rate, freshet or transient drainage of a high storage feature, then further reassessment of groundwater inflows may not be required and the adaptive management of these short-term effects would be evaluated under the Water Management Plan (WMP).

If the greater than predicted flows or quality would be considered as potentially long term, this may warrant review of the model calibration. The six-month averaging period of observation is based on observed seasonal variations in inflow quantities in mines situated in permafrost regions.

If model re-calibration is deemed necessary, future groundwater inflow quantity and quality would be predicted using this re-calibrated model and new results will be considered as part of the adaptive management of the groundwater quantity contribution to the WMP.

Modification of groundwater management strategies: the ponds, sumps and water conveyance strategies around the pit can be modified to mitigate the effect of additional groundwater volume or salinity prior to treatment and discharge. The water conveyance strategy will be evaluated and optimized during operations and closure to maintain post-closure commitment.

3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Quality Assurance (QA) refers to plans or programs that encompass a wide range of internal and external management and technical practices designed to ensure the collection of data of known quality that matches the intended use of the data. Quality Control (QC) is a specific aspect of QA that refers to the internal techniques used to measure and assess data quality. Specific QA and QC procedures that will be followed during sampling performed for the GWMP are described in Section 4.1 and 4.2.

3.1 QUALITY ASSURANCE

Quality assurance protocols will be diligently followed so data are of known, acceptable, and defensible quality. There are three areas of internal and external management, which are outlined in more detail below.

3.1.1 Field Staff Training and Operations

To make certain that field data collected are of known, acceptable, and defensible quality, field staff will be trained to be proficient in standardized field groundwater sampling procedures, data recording, and equipment operations applicable to the GWMP. All field work will be completed according to specified instructions and established technical procedures for standard sample collection, preservation, handling, storage and shipping protocols.

3.1.2 Laboratory

To make sure that high quality data are generated, accredited laboratories that will be selected for sample analysis. Accreditation programs are utilised by the laboratories so that performance evaluation assessments are conducted routinely for laboratory procedures, methods, and internal quality control.

3.1.3 Office Operations

A data management system will be utilized so that an organized consistent system of data control, data analysis, and filing will be applied to the GWMP. Relevant elements will include, but are not limited to the following:

- all required samples are collected;
- chain-of-custody and analytical request forms are completed and correct;
- proper labelling and documentation procedures are followed, and samples will be delivered to the appropriate locations in a timely manner;
- laboratory data will be promptly reviewed once they are received to validate data quality;
- sample data entered into a Mine-specific groundwater quality database will be compared to final laboratory reports to confirm data accuracy; and
- appropriate logic checks will be completed to ensure the accuracy of the calculations.

3.2 QUALITY CONTROL

The QC component will consist of applicable field and sample handling procedures, and the preparation and submission of two types of QC samples to the various laboratories involved in the program. The QC samples include blanks (e.g., travel, field, equipment) and duplicate/split samples.

Sample bottle preparation, field measurement and sampling handling QC procedures include the following:

- Sample bottles will be kept in a clean environment, capped at all times, and stored in clean shipping containers. Samplers will keep their hands clean, wear gloves, and refrain from eating or smoking while sampling.
- Where sampling equipment must be reused at multiple sampling locations, sampling equipment will be cleaned appropriately between locations.
- Temperature, pH, and specific conductivity will be measured in the field using hand held meters (e.g., YSI water quality sondes).
- Samples will be cooled to between 4°C and 10˚C as soon as possible after collection. Care will be taken when packaging samples for transport to the laboratory to maintain the appropriate temperature (between 4°C and 10˚C) and minimize the possibility of rupture. Where appropriate, samples will be treated with preservatives to minimize physical, chemical, biological processes that may alter the chemistry of the sample between sample collection and analysis.
- Samples will be shipped to the laboratory as soon as reasonably possible to minimize sample hold times. If for any reason, samples do not reach the laboratory within the maximum sample hold time for individual parameters, the results of the specific parameters will be qualified, or the samples will not be analysed for the specific parameters.
- Chain of custody sample submission forms will be completed by field sampling staff and will be submitted with the samples to the laboratory.
- Only staff with the appropriate training in the applicable sampling techniques will conduct water sampling.

Quality control procedures implemented will consist of the preparation and submission of QA/QC samples, such as field blanks, trip blanks, and split/duplicate water samples. These are defined as follows:

- Field Blank: A sample will be prepared in the field using laboratory-provided deionized water to fill a set of sample containers, which will then be submitted to the laboratory for the same analysis as the field water samples. Field blanks will be used to detect potential sample contamination during collection, shipping and analysis.
- Travel Blank: A sample will be prepared and preserved at the analytical laboratory prior to the sampling trip using laboratory-provided deionized water. The sample will remain unopened throughout the duration of the sampling trip. Travel blanks will be used to detect potential sample contamination during transport and storage.

- Duplicate Sample: Two samples will be collected from a sampling location using identical sampling procedures. They will be labelled, preserved individually and submitted for identical analyses. Duplicate samples will be used to assess variability in water quality at the sampling site. Duplicate will be collected and submitted for analyses at approximately, 10% of sampling locations. For smaller batches of samples (less than 10), at least one duplicate will be collected and submitted for analysis.

Additional QA/QC procedures that will be applied to the seepage survey component of the GWMP will include:

- Location – Universal Transverse Mercator (UTM) coordinates of seepage will be defined through the use of a hand-held Global Positioning System (GPS) unit and will be recorded in the field log book with a photograph of each pit wall.
- Sample Labels – appropriate sample nomenclature will be assigned to the sample labels that will define sample locations, sample type, year, and designation. These labels will distinguish between samples collected from seeps versus samples collected from sumps.

4 REFERENCES

Agnico Eagle (Agnico Eagle Mines Limited). 2017. Whale Tail Pit Water Management Plan. Version 1. January 2017.

Agnico Eagle. 2018. Whale Tail Pit Thermal Monitoring Plan. Version 1. May 2018.

Golder (Golder Associates Ltd.). 2016a. Westbay System Installation Summary – Whale Tail Pit Project, Nunavut. Dated 7 July 2016.

Golder. 2016b. Groundwater Quality Investigation, Amaruq, Nunavut. Dated 31 November 2016.

Golder. 2017. Hydrogeological and Permafrost Field Investigation, Amaruq Project 2017 Factual Report. 31 July 2017.

Golder. 2018a. Whale Tail Pit Project, Post-closure Hydrogeological Assessment for the Whale Tail Open Pit. Reference No. 1789310-180-TM. April 2018, in preparation.

Golder. 2018b, in preparation. Whale Tail Pit Project, Hydrodynamic Modelling of Whale Tail Pit Lake. Reference No. 1789310-181-TM.

Knight Piesold Ltd. 2016. Geomechanical Site Investigation Summary, 12 December 2016.

SNC Lavalin. 2017. Preliminary Studies for the Water Management and Geotechnical Infrastructures at Amaruq, 2017 Geotechnical Investigation Factual Report. Dated 25 May 2017.